# Shap-E: Generating Conditional 3D Implicit Functions

## Abstract

We present Shap-E, a conditional generative model for 3D assets. Unlike recent work on 3D generative models which produce a single output representation, Shap-E directly generates the parameters of implicit functions that can be rendered as both textured meshes and neural radiance fields. We train Shap-E in two stages: first, we train an encoder that deterministically maps 3D assets into the parameters of an implicit function; second, we train a conditional diffusion model on outputs of the encoder. When trained on a large dataset of paired 3D and text data, our resulting models are capable of generating complex and diverse 3D assets in a matter of seconds. When compared to Point-E, an explicit generative model over point clouds, Shap-E converges faster and reaches comparable or better sample quality despite modeling a higher-dimensional, multi-representation output space. We release model weights, inference code, and samples at https://github.com/openai/shap-e.